

## **Technology Application Paper**

EDNET and Polycom

In response to the assignment to complete a “Technology Application Paper” I elected to survey a number of experts and draw upon other resources to compare the use of EDNET with Polycom. Immediately it was pointed out that Polycom is simply a brand name for an H.323 appliance. H.323<sup>1</sup> is often referred to simply as IP<sup>2</sup> video, and is available through other systems (other brands) such as Tandberg and VCON. This paper is actually a review of the EDNET system used by the Utah Education Network and IP video. The review identifies some of the implications of the State of Utah transitioning from EDNET to Internet IP video, specifically Polycom.

The term EDNET may be taken to mean the actual delivery system by which courses are delivered to over 200 receiving site class rooms throughout the state or it may also refer to the various components involved in the overall distance education delivery mechanism. In the latter sense, the EDNET system is composed of five services: administrative services, program services, public information and communications, technical services and training services.<sup>3</sup>

These services are a good example of the foundational support system that may be needed to support broadly offering the shared use of any distance education technology in a consistent and organized fashion. However, some systems, including IP video, may require less centralized support functions and allow for more autonomy.

For the purposes of this study the term EDNET refers to the technology used for delivery of distance education in Utah and Polycom is the brand of IP video technology compared. It should also be noted that this report does not reflect a comprehensive study and is only a brief overview of a few fundamental elements.

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<sup>1</sup> H.323 is An International Telecommunication Union (ITU-T) standard that describes packet-based video, audio, and data conferencing. As such, it is a protocol for the transmission of real-time audio, video and data information over packet switching-based networks. Such networks include IP-based (including the Internet), Internet packet exchange-based local area networks, enterprise networks and metropolitan and wide area networks. H.323 can also be applied to multipoint-multimedia communications. For further information simply conduct a Google search using the key word command “define: H.323” (without the quotation marks).

<sup>2</sup> IP stands for Internet Protocol

<sup>3</sup> <http://www.uen.org/ednet/html/faq.html>

## **Aspects of Distance Education Delivery**

Based on a survey response from Mr. Jeff Egly, Field Operations Manager for the Utah Education Network, delivering distance education using the EDNET medium and technology may be described as transmission of data with the use of dedicated video circuits via fiber optic equipment, MPEG 1, MPEG 2, or video microwave.

Ms. Cathy Beal, coordinates distance education at Snow College. Her description, in lay terms, indicates that delivery of classes over EDNET generally requires cameras, camera controls, microphones, audio mixers for the microphones, televisions, a VCR/DVD, Elmo, and other peripherals as required for the particular class.

The Utah Education Network (UEN) must utilize different technologies for video circuits depending on the region of the state. For example, Utah State in Logan is connected directly to UEN's video backbone. Thus, in Logan the technology used is a broadcast quality service called Commercial Video Digital Service (CVDS). Interestingly this service is only available in the Qwest Territory. San Juan School District is not in Qwest territory, thus the EDNET service provided in that region is a combination of MPEG 1, MPEG II, and video microwave<sup>4</sup>.

Because Polycom delivers audio and video through the internet, delivery of distance education via Polycom requires an internet connection into which the Polycom system is plugged, and IP addresses to reach various destinations. Of course Polycom demands sufficient network bandwidth between all locations participating in the distance education activity.

## **Limitations**

Classes or events that utilize EDNET are limited to the number of video circuits available for a site or region. For example, if three video circuits serve a school, the number of classes they could utilize concurrently would be three. On the other hand, limitations of IP video are based on network bandwidth. An example of this provided by Egly is as follows: "If there are 45 M/Bits of bandwidth to a college and 15 M/Bits of this bandwidth are used for their Internet traffic then 30 M/Bits of bandwidth is available for IP Video traffic." He further explains that, "each IP video device in the UEN network typically uses 768 kbps of bandwidth. This is substantially more efficient than some of the legacy video services and it provides a level of flexibility and freedom not previously available."

Although it is not generally viewed as a limitation, training is a critical factor in the use of either the EDNET or Polycom system. I have observed first hand the challenges that arise when a facilitator is absent or untrained, as well as the frustration an instructor

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<sup>4</sup> Based on written survey response (8 Mar 2005) and telephone interview (8 Mar 2005) with Mr. Jeff Egly, Field Operations Manager for the Utah Education Network.

experiences when they do not possess the necessary understanding for using either system for delivery of course content.

Dr. George Miller, trains distance educators for the State of Utah. He points out, “Training is required of all instructors. Administrative support is still the critical factor in any distance learning initiative by a school system. It has to be there or nothing works.”

### **Pros and Cons**

EDNET is a system that is already in place. Instructors, facilitators and learners are accustomed to the system. Polycom is new to them, thus there is a certain amount of relearning that must occur. For the most part, this adaptation to change appears to be relatively smooth – with only a few bumps as is to be expected. If indeed the technology is transparent to the learner they will not notice much difference at all. The facilitators and instructors are most likely to have to adapt the most. This sentiment is reflected in the following comment from a distance educator in Utah, “...many EDNET teachers, including me, will often run their site without a local facilitator. I would dare not do that now with Polycom... it is too complex.”

According to Egly, main advantages of using Polycom over EDNET include “increased flexibility, autonomy and efficiencies that were not available when the original EDNET network was implemented.” The following are specific examples of such:

- Dual stream (H.238) which will allow the instructor to display applications such as Excel or AutoCAD with XGA quality on one screen for the students and on a second screen display the instructor and classroom for the students, simultaneously.
- Automatic video switching which changes the camera view from one location to another by keying on the voice of whomever is currently speaking.
- Ability to route the class to as many sites as necessary without regard to a limitation on availability of dedicated circuits – as long as Internet bandwidth is sufficient.
- Decrease in and/or an economical shift of costs when compared to continued use of and/or expansion of the EDNET system.

Based on input from those who have used both EDNET and Polycom, the downsides of migrating to Polycom include the following frustrations:

- For many there is a decrease in video quality with Polycom verses EDNET. However, it should be noted that in some cases, such as rural locations, Polycom actually provides an improvement in video quality.<sup>5</sup> Additionally, Polycom enables delivery to sites which previously with EDNET may have competed for

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<sup>5</sup> According to Egly, two examples of such locations are Grouse Creek and Park Valley, Utah.

scarce circuits and actually ended up not being able to receive the transmission at all because they were “crowded out” – any video is better than no video.

- If a network goes down the class goes down.
- Pinpointing and resolving problems is more difficult or perceived to be so, with Polycom. According to Beal, “when there are problems, it is sometimes hard to tell where the problem is coming from. Is it the network, this site, that site, the originating site? Is it a connection somewhere that is loose? Is it the Polycom unit itself? Do we have the right IP address? Is there a firewall issue so we can’t connect? It is harder to pinpoint where some of the problems are coming from. If it is a network issue and it is after hours, how do we get the problem fixed... the network guy has gone home for the day.”

In summary, EDNET has served the needs of educators and learners through facilitating effective distance education in the State of Utah for many years. However, transitioning to an IP video system appears to be the choice of preference for maintaining a viable system for delivery of distance education. Furthermore, this technology provides a vast array of services which means it can be used in consumer, business and entertainment applications. The system that has been selected is Polycom.

The following speculation from Dr. Miller provides a fitting summary as to the future of such technology: “Broadband capabilities will allow schools and everyone to have full scan video systems that will be ubiquitous and easy to access from home, school or business. Education will become more pervasive as a life-long experience instead of K-16.”